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NOTES ON THE ETHNOLOGY OF PUKAPUKA

By

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INTRODUCTION

ACKNOWLEDGMENTS

The present notes on Pukapuka are based on field observations which I made during the three-day visit of the Templeton Crocker Expedition to the island in April 1933, on a study of artifacts in Bernice P. Bishop Museum, and on ethnological information about the island found in literature.

During the visit I remained ashore as the guest of Mr. Geoffrey Henry, Resident Agent, who extended to the party all the courtesy and hospitality for which the South Seas are noted and devoted all his time to us, explaining what he could of Pukapukan customs, guiding us to places of interest, and arranging dances and wrestling exhibitions. I am deeply grateful to him for the ethnological information and the time he devoted to interpreting for me while I questioned native informants. Appreciation and thanks are due also to the chiefs and people of Pukapuka for ethnological specimens.

I am particularly indebted to Mr. Templeton Crocker for his generous invitation to accompany the expedition, for his notes and measurements of the large sailing canoe and the native names of the parts of bonito hooks, and for permission to use the excellent drawings and photographs made by Mr. Toshio Asaeda.

LANGUAGE

The Pukapuka dialect has five vowels, *a*, *e*, *i*, *o*, *u*, and nine consonants, *k*, *l*, *m*, *n*, *ng*, *p*, *t*, *v*, and *w*. The *h* is dropped but is represented in speech by the glottal closure, as in the Mangaian dialect and two Maori dialects (14, p. 6).* The sound *th* is frequently given instead of *h*.

When the glottal closure is at the beginning, and sometimes when it is in the middle of a word, an added breath is introduced before the succeeding vowel, giving a sound of *i* consonant. This is repre-

* Numbers in parentheses refer to Literature Cited, p. 49.

194 197 sented in the text as *'i*. This extra sound following *h* is found in the dialect of the Tokelau Islands (9), Manihiki, and Rakahanga (13). Many natives of Pukapuka drop the glottal closure at the beginning of a word and retain only the *i* sound. To English-speaking people this sounds like *y*, as in the word year, and has led Frisbie (3), Hutchin (6), and Trotter (17) to write *y* in words that contain this sound. A comparison of words written with *y* by Trotter with cognate words of the Maori dialect (16) and the Samoan dialect (10) shows that the *y* becomes *h* or *r* in Maori and *s* or *l* in Samoan. I believe that Trotter has confused the liquid sound of the Pukapukan *l* with the *y* sound which he heard in other words. He has given *lengalenga* (green) as "yengayenga" and *lava* (multitude) as "yava". The forms *lengalenga* and *lava* are found in the Samoan dialect also. In all other words containing *y*, the *y* becomes *h* in the Maori form and *s* in the Samoan form, as shown in the following comparative list of words:

Pukapuka	Maori	Samoa	Translation
ye	———	se	not
yauariki matangi	hau	sau	gentle breeze, fresh, cool, dew
yeuyeu	heuheu	seu	to mix or scatter
yoka	hoka	so'a	to husk
yoyongi	hongi	sogi	to smell or kiss
yna	hina	sina	grey, white

The original Polynesian *h*, which Buck (13) suggests has been retained in Hawaii, and the old form *wh* of the Maori dialect (also retained in the Manihiki dialect) has been developed into a full *w* sound in Pukapuka speech. The Hawaiian word hau (*whau* in Maori) becomes *wau* in Pukapuka.

The sound of *t* also has a variant sound *ts* before the vowel *i*, as in the Tongan and several other Polynesian dialects. *K* is often given the sound of hard *g*, a characteristic often heard in Tokelau speech. The name of the Pukapuka god, Te Akuaku, was pronounced by one informant "Te Aguagu". *L* has an intermediate sound between *l* and *r*, as pronounced by many of the natives. In representing it as *l*, I may be influenced by the fact that I had previously heard only Polynesian dialects containing the true *l*. Hutchin, Frisbie, and Trotter, familiar with dialects containing *r*, evidently heard the sound of *r* and have represented it so in their writings. The sound of *v* exists in the words *vaka* (canoe) and *vai* (water) but is usually sounded as *w*.

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Physical Characteristics

At the time of our visit at Pukapuka the natives were living away from the village. For this reason it was impossible to make a series of physical measurements. The following notes sum up the observations made of those natives who came in from time to time to see our party.

The composition of the features differs from that of Samoans, Tongans, and western Polynesians. The faces of many Pukapukans closely resemble natives in the Tokelau Islands, a similarity that is startling in many individuals. Many Samoans have an Oriental cast of countenance in their high cheek bones and upward-tilted eyes, which frequently have a trace of an epicanthic fold. Most of the natives at Pukapuka have high malars and wide, deep-set eyes with no trace of the epicanthic fold. Prognathism is absent. Brow ridges are of medium thickness and the glabella is prominent, as compared with these features in Samoans and Tongans. I saw one markedly convex nose and several that were slightly convex. Many noses are long and relatively narrow for Polynesians, and many have sharply flaring alae, characteristic of Tongans. The root is low and concave. The lips varied from thin to exceptionally thick and everted, but the thick type is the commoner one. The hair is black, varying from a medium to a deep wave. The men have a medium beard, heavier than is common among Samoans. The skin color of the face is exceptionally dark for Polynesians, but this may be due to life on an atoll where a great deal of time is spent on the water and exposed to the sun. Both men and women had the upper parts of their bodies clothed, so I was unable to observe less-exposed parts of the body. The women were short for Polynesians and much shorter than the men.

Geography

The atoll of Pukapuka (latitude 10° 53′ S., longitude 165° 50′ W.) lies about 390 miles northeast of Samoa. Its nearest neighbor is Nassau Island, 45 miles southeast, an atoll which formerly had a native population but is at present occupied by a European planter and laborers from Pukapuka and Ellice Islands.

Pukapuka consists of three islets and a few small sand keys which together form a rough triangle with the apex to the north (fig. 1). The northern islet, Pukapuka, is about a mile wide. The entire population lives along the southern or lagoon shore of this islet. Motu Koe (Ko) and Motu Kotava (Katava, Kavata) are planted with coconuts, taro, and fruit trees, and are reserved solely as plantations. Each has a small settlement of shelters and houses which are used during the harvesting periods. Bryan (1) reports that the western end of Motu Kotava has one of the most luxuriant growths of vegetation on any atoll in western Polynesia.

000 The islands are surrounded by a continuous reef. Entrance to the land-locked lagoon is through a pass in the western reef wide enough for canoes but not for larger craft. All goods must be trans-shipped and carried ashore in small boats.

The climate of Pukapuka is said to be remarkably equable and the rainfall usually sufficient. During the winter, April to September, the days become exceedingly hot and breathless when the wind drops, and the vegetation often becomes dry and even scorched. It is a season of suddenly changing and heavy winds which descend with little warning, and may destroy all the coconut trees. In 1914 a great tidal wave washed over most of the atoll.

Each of the islets has seep holes or wells of brackish water which the natives can drink, and formerly water was caught from the frequent sea showers which pass over the island; but neither of these sources insured an unfailing supply. Today water caught from the roofs of the church and meeting house is stored in reservoirs.

The flora includes several useful plants. Fair-sized *puka* trees (*Hernandia ovigera*) grow on Motu Kotava, but elsewhere the trees are small. *Akanava* (*Cordia subcordata*), a hard wood very resistant to water, grows on each islet. Canoes are made chiefly from sections of the trunks of these trees. *Puapua* (*Guetarda speciosa*) and *wetau* (*Calophyllum inophyllum*) are plentiful and are used in canoes when *akanava* is not available. *Puka* is used for outriggers and for easily worked implements and utensils. Coconut trees are plentiful. *Wau* (hau; *Hibiscus tiliaceus*) supplies a bast which is made into very strong fish line and cordage for fish nets. The wood is used in house construction and for fire plows. *Wetau* wood is used in making containers. *Ngangie* (*Pemphis acidula*), a bush which supplies strong, branched pieces of wood, grows on the atoll and is made into *Ruvettus* hooks. The *tsiale* (*Gardenia tahitiensis*) is a tree with deliciously fragrant flowers which are woven into head wreaths and used for decorating the body. At least two varieties of hala (*Pandanus*) grow on the atoll. The most common variety (*'ala*) is used in mat-making, and its fruit is an important food. The second variety (*kie*) is made into finer and softer mats and, formerly, 241 into the men's garment (*malo*). Bryan (1) reports that no bread- 137 fruit trees grow on the island.

262 The vegetable staples in the native diet are coconut and taro. 439 Coconuts are abundant; in profitable seasons as much as 100 tons of copra are exported.

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of copra are exported. Nine varieties of taro (*Colocasia esculenta*) grow on the island; *talo Borabora, talo maoraora, talo koli, talo uakene, talo ncncngu, talo kula, talo pongi, talo taraki, talo 'enga'enga.* *Puraka* (*Cyrtosperma chamissonis*), a coarse tuber of the taro family with enormous heart-shaped leaves, is grown in the wet pits. This plant is said to have been introduced from the Cook Islands. Bananas (*wuti*), papayas, limes, and sugar cane grow on the island, but because of the poor soil the production is slight and contributes very little to the food supply. Hutchin (6, p. 173) states that sweet potatoes (*kumala*) and arrowroot were formerly grown.

Fish forms the chief flesh diet. Turtles are caught during the mating season when they are off the reefs and the females come ashore to lay their eggs in the sand. Pigs and chickens are kept on the island but are eaten only on occasions of celebrating some event.

Although Pukapuka was sighted by a European ship as early as 1765, it has enjoyed an existence remarkably free from intercourse with Europeans because of its isolation and its lack of natural resources. Captain Byron discovered the island on June 21, 1765, and named it "Danger Island" because of its treacherous submerged reefs and rapid currents. Lovett (8, p. 372) states that a native missionary teacher was on the island in 1857 and had proselytized most of the natives before the arrival of Reverend W. W. Gill, the first European missionary, in 1862. During the decade 1860-70 Peruvian slavers raided the island for laborers to carry to South America. In two visits they took 150 men and women, none of whom ever returned to their home (11).

The island was formally annexed by Great Britain in 1892. In 1901, by an Imperial Order in Council, Great Britain extended the boundaries of New Zealand to include the Cook Islands, Tongareva, Manihiki, Rakahanga, Palmerston, Pukapuka, and Niue. Pukapuka is now governed by the Cook Islands Administration. At present Mr. Geoffrey Henry, Resident Agent, directs the government, and with Mrs. Henry conducts the island school and cares for the health and sanitation. Most of the population belongs to the London Missionary Society Protestant church, which is under the direction of a native pastor. In 1919 Mr. Wicks, of the Seventh Day Adventist sect, arrived at the island and directed the building of a church during his temporary residence. A small group still retain their membership in this church. No European missionaries live on the island today.

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Communication with the island consists of an occasional visit of a boat from the Cook Islands and the semiannual arrival of the schooner operated by Burns-Philp Company, which comes from Apia, Samoa, to buy copra. Traders have done business on the island in the past, but the last store was closed in 1934.

MYTHOLOGY

The first people of Pukapuka, or Nukuloa, as it was named by the ancients, were descended from the chief god of the island. This god sprang from a rock which he afterward made into the land. The creation story told to me is this:

> Previous to the creation of the land all the gods lived in Tonga, but someone pulled Tonga out of the sea and all the gods flew away. One of these gods was Tamaei (Tama'ei) or Tamathei, who took the form of a white tern (*kaka*) and flew over the ocean until he came to a place where he saw a white coral head growing on the bottom. He watched this but it ceased to grow. Tamaei flew back to Tonga but returned to the coral some time later. He found it growing and rising. However, it again stopped growing when he looked at it. Tamaei returned to Tonga a second time and made a third visit to the coral later on. This time he found it very close to the surface. As he watched the coral rise, a man, Mata Aliki, sprang from the coral and, finding no land about him, he made the island of Pukapuka from the coral on which he was standing. Mata Aliki became the supreme deity of the island and progenitor of the people.
>
> Tamaei returned to Tonga and later came to Pukapuka in the form of a human being. He was deified by the Pukapukans but he never became powerful as a god.

Gill (5, p. 123) states: "He [Mata Aliki] was a god, the son of Tamaei, who came from Tonga. His mother was a *vatu*, or stone. He [Mata Aliki] made the earth and the sea." Hutchin (6, p. 173) records that "Tamaye" (Tamaei) watched a rock in the sea. The rock suddenly burst asunder and a man named Uio appeared. He had a wife, Te Vaopupu, from Tonga; a son, Tu-muri-vaka; and a daughter, Te Mata-kiate.

This creation tale has several incidents that relate to the western Polynesian creation stories concerning Tangaloa. The bird of Tangaloa, generally a snipe (*tuli*) elsewhere, flies down to earth but finds no place to alight. After several flights the bird sees dry land breaking through the waves. In one version of this tale, man is born from the breaking asunder of the rock. An analogous tale is recorded by Buck (13) in the neighboring islands of Manihiki and Rakahanga.

Writing of the subsequent history of Pukapuka, Gill (5, p. 123) states: ooo

He (Matariki) founded the villages named Mariutu, Matanga, Angi-pure, Akovika, Amaunga, and Aronga. It was in these places that men grew and increased to great numbers. In those days men did not die. The *ariki* (or high chief of the island) at that time was from Mariutu, and his name was Akau-te-vaka. His period was a happy and peaceful one; no cannibalism existed, nor wars.

Hutchin says that a flood covered the island when Anuna, a girl of wicked influence among the people and the daughter of the high chief, was living. He names three districts of early Pukapuka which were settled by the Tongan warriors, Tokai-pore and Taupe-roa. These districts were Avarua or Kotiporo, Te Awea or Pana-uri, and Taka-numi or Ure-kava, but he does not state whether or not the people of these districts were Pukapukans or others brought by the Tongans. None of these names given by Hutchin and Gill appear as present land divisions.

The story of a settlement of people called the Eaki ('Aki) on Motu Ko under these same Tongan chiefs is related in a myth about them, and a winged man, Manava Nui.

At one time two canoes with a strange people, the Eaki, landed on the islet Motu Ko and settled there. It is thought that they came from Tahiti. They were under two chiefs, Taupeloa and Tokaipole, who were either Tongans or Samoans. The two chiefs and a few followers settled on the western point of the island, Matauea, and the Eaki lived on the eastern end. Although the people on Pukapuka Islet did not like these strangers they did not drive them off. While the Eaki lived on Motu Ko they dug the large taro pits which are used on Pukapuka today.

After the Eaki were well settled on their islet, a man named Manava Nui was born there. On the southeastern side of the islet Manava Nui had two stone seats in which he sat and watched for turtles floating on the surface of the sea. When he spied one by the reflection of the sun on its wet, shiny back, he flew over the sea and caught it up. He left all that he caught with the Eaki, to be divided among them. This continued for some time, but the two chiefs on Matauea Point were ignorant of his existence.

Among the people of Eaki was a woman, Tauianingaloa, who was enraged because she was not given a fair share of the turtle meat caught by Manava Nui. To bring revenge upon her people for their treatment of her, she went to the two chiefs, Taupeloa and Tokaipole, concealing herself by covering her head with a basket and swimming unobserved across the water between the two points of the islet. She went on until she could stand in the water before the house of the two chiefs, and, calling to one whom she saw, told of the plot of her people to kill both of them and of the existence of the remarkable man, Manava Nui, who could fly about in the air.

This chief wished to call the other without alarming the woman. Pointing to a bird perched in a tree overhead he asked if the wonderful man of whom

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000 she spoke could fly as high as the bird sitting there. She replied that he could fly higher. Then the chief took his spear and hurled it into the air. "Can Manava Nui fly as high as that?" he asked.

The other chief, who was fishing on the reef behind the islet, saw the spear in the air and ran to his home, and learned the news that the woman had brought to them. They called the woman ashore and killed her, lest she return to her people and tell them that the two chiefs were aware of their intentions.

That night they crossed with their followers to the first settlement of the Eaki. It was the custom of all the Eaki to sleep side by side, using a long log as a pillow. The two chiefs carried a second log to where the Eaki were sleeping and crushed their heads between the two logs. They went on to the other settlement of the Eaki and attempted to kill them in the same way. These people all chanted as they slept. The chiefs dropped a log on the heads of these people also, but a strong man (*toa*) hurled it off, shouting "*Tuki pou!*" (Strike the post!) The people sleeping with him leaped to their feet and ran to Pukapuka Islet along the low stretches of coral which surround the lagoon. It was a stormy night with thunder and lightning. Manava Nui was sitting in one of his stone seats, watching the sea. When he heard his people crying out and running away, he followed them, flying above the reef. The two chiefs pursued him, hurling their spears into the air to prevent his coming ashore. At the passage in the reef at Pukapuka Islet, Taupeloa and Tokaipole speared Manava Nui to death as he was flying to the reef to rest. They rushed to the village and told the Pukapuka people the murderous plan of the Eaki. The Pukapuka people turned on the Eaki and slew them all as they came along the reef from Motu Ko to Pukapuka Islet. After burying the bodies in a single pit, they went out on the reef and dragged ashore the body of Manava Nui; and when they cut him open, they discovered that he had eight hearts.

Manava Nui was buried at a point where the boundaries of the three sections of the village meet. When the two chiefs died later, Tokaipole was buried between Loto and Iaki sections and Taupeloa, between Loto and Ngaki sections. Two ancient graves on these boundaries are pointed out as the burial sites of these heroes.

Frisbie (2) translates Manava-Nui as "Stout-Hearted" or "Many Stomachs." He describes the grave of Manava Nui as 16 feet long and 5 feet wide. The headstone is chiseled to represent a bird, and four large slabs are placed on either side of it for his eight fabulous "stomachs".

793 The story of the wrestling of the gods Te Akuaku and Ngaliieieu
539 is told.

Te Akuaku was a god of Akalava [Mangaia?] who traveled to Tonga, where he found all the gods gathered for a wrestling tournament. Te Akuaku wore the rainbow as a wrestler's malo around his waist, and around his shoulders he wore the rays of the sun. When he approached and challenged the others to wrestle, all the gods stood back, frightened by the brilliance of this stranger. Finding that no one would accept his challenge, Te Akuaku left Tonga and journeyed to Samoa. As he came to shore, he looked down into

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the water and saw a black god living beneath a rock called Papa. This god living under the water was Ngaliieieu. He rose out of the water when he saw the brilliant god above him and challenged him to wrestle. Te Akuaku grasped Ngaliieieu and attempted to throw him beyond the sea so that he would be lost forever. But two birds belonging to the god of the sea flew to him and held his leg so securely to the reef that Te Akuaku could not move him any farther. At last Te Akuaku gave up and dropped his opponent into the water. Ngaliieieu immediately arose and tried to throw Te Akuaku over the ocean. A long combat followed, but Ngaliieieu could do no better with his opponent. Two worms came to the assistance of Te Akuaku and held him to the reef so that Ngaliieieu could not throw him over the sea. Ngaliieieu gave in and released his foe, and the contest became a draw. Because of the inability of either to overcome the other, the two gods became firm friends (*'oa*) and set out together for Pukapuka, where they settled down to live.

LAND DIVISION AND UTILIZATION

VILLAGE

The village on Pukapuka Islet is divided into four sections belonging to three groups of people.

The western or leeward section, Iato, is separated from the remainder of the village by a shallow cove. From Iato a causeway built of coral blocks leads to Loto, the central section, and a road continues eastward to Ngaki, the third, or windward, section. In 1914 a great tidal wave flooded part of the Loto section and destroyed the ancient causeway, which has since been rebuilt. The people who had lived in the flooded part rebuilt their houses at the eastern end of the village, which now constitutes a fourth section. Although the natives have boundaries marking the divisions of Loto and Ngaki, there is no interval without houses. A pathway, which in modern times has been neatly curbed with low coral slabs, runs from the landing beach on the southwestern shore of the islet and through the three sections to the southeastern shore. A branch crosses the lower extension of the taro pits and continues to the meeting house and the home of the Resident Agent. From these main pathways numerous bypaths lead through the village and into the taro patches and coconut plantations behind.

The church is situated in Loto, the center of the village (fig. 1).[1] In front of the church is a large village green (marae) of Samoan type, where the people gather for festivals and exhibitions. Quadrangles edged with curbings of coral slabs, the sites of ancient maraes which were reserved for religious ceremonies, are still to be seen in

[1 Lp. 12 -- Analyst]

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000 the village. They have been abandoned for many years, and houses now stand on many of them. The high chief's burial marae has been preserved as a modern cemetery (pl. 1).

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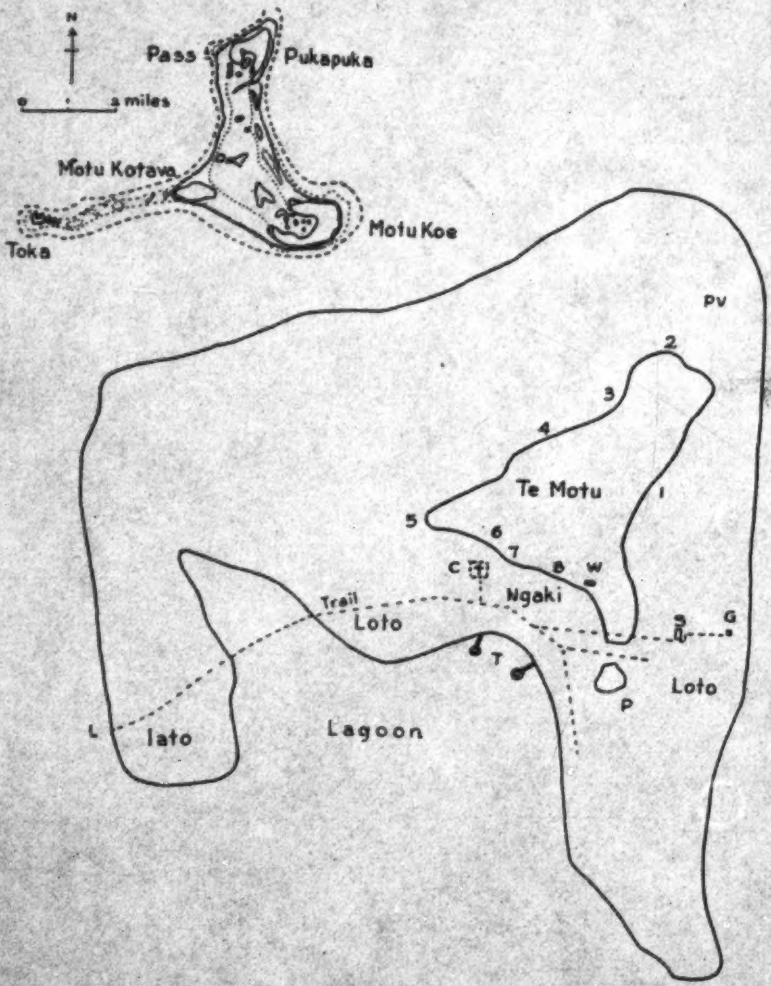

FIGURE 1.—Map of Pukapuka Islet showing village sections and land holdings: Te Motu, communal taro lands of Loto section; *G*, resident agent's house; *L*, landing place; *P*, puraka patch; *S*, school and meeting house; *T*, toilets over lagoon; *W*, watchhouse in taro patches; *C*, church; *Pv*, Loto plantation villages. Small plantations and land divisions: 1, Te Utu; 2, Walakakala; 3, Te Wela (Vela); 4, Te Puapua; 5, Te Auma; 6, Te Velo o te Kilikili; 7, Taikaima; 8, Te Pa.

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All canoes are kept uncovered on the southern, or lagoon shore, of the islet. In the village are several small storage houses containing old, disassembled canoes. Within the last few years toilets have been built on piles of coral blocks several yards from the lagoon beach.

Taro Cultivation

The early inhabitants of Pukapuka solved the problem of cultivating taro on an atoll by digging large pits. They created rich soil by depositing dead coconut fronds and other fallen leaf material from the bush and allowing it to rot in the pits. Water seeped in, and a thick mud, in which taro grew excellently, was formed. During the centuries these pits have been enlarged into great excavations which will produce enough taro for the entire population (pl. 2, *B*). As the soil must continually be replenished, each row of taro has a line of coconut fronds and leaf material laid along it. The most extensive of these pits have been made on Pukapuka Islet. Excavation still continues to a limited degree.

Plantations

Each section of the village owns a part of the atoll on which it grows its taro and coconuts. Iato section owns the southwestern islet, Motu Katava (Lau-la-lalo); Ngaki owns the southeastern islet, Motu Koe (Lau-la-lunga); and Loto owns Te Motu, a part of Pukapuka Islet. *Motu* means both "islet" and "division of land". These three *motu* are communal property of the section to which they belong and are reserved for the production of food.

The division of the small food supply must be carefully supervised and restricted. Formerly the food collected was divided among all adults and children, the children receiving smaller shares. In the taro patches on Pukapuka Islet, each individual of Loto now has a plot 9 feet square which he cultivates and uses for his own subsistence (pl. 2, *A*). There are both communal patches and small ones belonging to individuals or families. In modern times the coconuts from the communal lands are still divided for the making of copra. The village council allots to each man the number of coconuts he is to cut and dry. The entire crop is collected and sold to the trading schooner, and each man receives a proportionate part of the money.

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In order to prevent theft or any unfair proportioning of the taro and coconut crops, a rigid tapu excludes everyone from entering a *motu* without permission from the village council. Loto erected a watchman's house on the embankment of the main part of the communal taro pit and walls of coral slabs (pl. 3) to insure the protection of its taro supply behind the village.

When it is time to gather food the entire population moves away from the village. During the harvesting period each section lives on its own *motu*, where it has a small settlement of houses. Harvesting that includes the cutting and drying of coconuts for copra requires a longer period of residence at the *motu* settlements than the ancient harvesting periods and it is necessary for the women and children to accompany the men and settle away from the village for several weeks. Formerly the women and children were forbidden to go into the *motu* and the men did all the harvesting as the need for food arose. Today while the main population is away a few old people and children remain in each village section to guard the houses and property left behind. None of the others are allowed to return to the village during the harvesting period. Our visit to Pukapuka during the harvesting period brought the people back to the village, for a ship is an unusual circumstance. Yet each night they returned to their own plantation quarters.

Motu Kotava Islet has one plantation village, Aonga, which consists of a cluster of small huts in the middle of its north shore. A path running southward from the village divides the island. The land at the eastern point of the islet is Puipui; the middle division is Oloavalu, and the western division, Kokoakanava. The western point extending out to the southern reef is Te Auma. Uluniu and Alitaiva are two pieces of land along the southern beach.

Motu Koe Islet has its plantation village, Te A or Te Aa, in the heart of the bay on the lagoon shore. The houses are in two groups. At one time there were settlements of the immigrant Eaki people located at each end of the islet. These people dug the large taro pits which are used by the present Pukapukans. Smaller pits have been dug by the present people also. This islet has several ancient, pre-Christian graves, where Pukapuka chiefs, killed in fights against the Motu Koe people, were buried.

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Land Divisions

Pukapuka Islet is divided into several districts. Their names in order, from the eastern tip (Matautu) to the western tip (Matauea), are as follows:

1. Matautu
2. Niutaulele
3. Teliakinala
4. Waitu
5. Wonio
6. Te Ionga o te peu
7. Wangawanga
8. Kokoloa (eastern group of houses on beach)
9. Te A (western group of houses)
10. Walewu
11. Matapoko
12. Tealapalakula
13. Teaua

The land of the islet outside the village is divided into sections used by the community, kindreds, and individuals. The main portion of the plantation and garden land is Te Motu and belongs to Loto, the central section of the village. On the northeastern shore there is a settlement of huts to which the Loto people go while working in their land. The heart of Te Motu is a great communal taro pit in which every Loto man (*akatane*) and woman (*akawawine*) has an equal right. Around it are eight land divisions of smaller taro patches and coconut plantations (fig. 1). Between the road and the southern side of Te Motu are pieces of land on which there are houses or coconuts and a few taro patches. All but one of these pieces belong to individuals and are inherited by the children from their parents. The names of these lands are:

1. Utupoa
2. Teneku
3. Angialulu
4. Paepae
5. Kiki
6. Oaletoa
7. Umalolo
8. Amanaia
9. Utulei
10. Tangalepule
11. Taiotaupapa
12. Kaiue
13. Telimatini
14. Tekolo
15. Mataniua

It was not possible to go over all the land divisions of Pukapuka Islet or the two southern islets to examine the extent of the divisions and to see whether Iato and Ngaki had pieces of land owned by individuals. It is certain that the entire atoll is not owned communally by the village, although the ultimate control and use of the land rests with the chief council. On Pukapuka Islet individuals, or perhaps kindreds headed by one individual, have pieces of land whose products and ownership are not regulated by the village council. This may be true of the two other islets, which are divided into several pieces;

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ooo but as they are away from the village they could not be visited without the sanction of all the owners as expressed by the village council. This arrangement was practiced in the Tokelau Islands (9), where the kindreds owned the land, but no individual might visit a plantation off the village islet until the village council decreed that every member of the community might go.

SOCIAL ORGANIZATION

Kinship System

The five generations recognized in kinship terms, reckoned from the point of view of the individual, include all generations normally known during a lifetime: grandparents, parents, the individual, the children, and grandchildren. The following kinship terms include collateral lineal relations, elder and younger relatives in some instances, and relatives by law.

Tupuna: grandparent, great-uncle, or great-aunt
Matua: parent
Tuakana: brother (man or woman speaking)
Tua'ine: sister (man or woman speaking)
Taina: cousin of same sex as speaker
Tama: son
Tamawine: daughter
Makupuna: grandchild, grandnephew, or grandniece

In general relationships sex is denoted, if necessary, by *tane* (male) and *va'ine* (female), as in *makupuna tane* (grandson), and *matua va'ine* (mother).

Buck (13) states that in the kinship systems of Tongareva, Mangaia, Manihiki, and Rakahanga, *tuakana* denotes older brother or sister, and *teine* younger brother or sister, men speaking of brothers only and women speaking of sisters only. This age distinction was not pointed out at Pukapuka, where both men and women were said to speak of their brothers as *tuakana*. In the Cook Islands *teine* is the corresponding term for *tuakana*. In Pukapuka *taina* (*teine*) is a cousin of the same sex as the speaker. The Pukapuka term for sister, *tua'ine*, man or woman speaking, is used in the Cook Islands by brothers only speaking of their sister and has a sex distinction, according to Buck. The corresponding term used by sisters in speaking of their brothers is *tuangane*, a term lacking in the Pukapuka system. The distinction shown in the terminology between age and

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sex of brothers and sisters was not inquired into. However, the age distinction, as it functions in the other Cook Islands, does not appear to exist in Pukapuka. Titles do not descend directly through the male side. When a chief dies, the title goes normally to his next youngest brother; but if there is a sister older than all the brothers, her eldest son will receive the title.

In Pukapuka the seniority of males has this variation: an elder sister is *tuakana* in that her son has superior claim to title and rank over his mother's younger brothers. Age distinction is denoted by the terms *tainamua* (eldest) and *tainamuli* (youngest), according to Hutchin (6), who also gives the terms *kaina tane* (brother) and *kaina va'ine* (sister); but these include any male or female relative. The eldest son of a chief is the *uluiaki*, and the younger children of both sexes are *palekimuli*. These terms are said to be used only in the chiefly language. The second son in any family is the *angavale*.

The eldest male is the head of the family or kindred. This family chief is the *mataiapo*. The eldest sister of the senior or ranking family of the kindred is the *aukimua*: her brothers and their children refer to her by this term. She takes care of the chief's food and sacrifices to the gods. The father's sister and the daughter of the father's sister are termed *matua* (parent). Hutchin (6) gives the term *inakava* as the daughter of a sister and *vale atua* as daughter of an elder brother. The Polynesian term *ilamutu* had no meaning to the native informants in Pukapuka, but the fact that the eldest male of the family has a special term for and relationship with his eldest sister and that a man refers to his father's sister and her daughter as parent (*matua*) suggest that the senior female and the female side of the kindred were considered with the marked importance that exists in Samoa and other islands with the *ilamutu* relationship.

Brother-sister Avoidance

The custom of tapu or avoidance between brothers and sisters and those who are termed brothers and sisters of a kindred in the classificatory system of Polynesian relationship exists in Pukapuka society. However, the information regarding this restriction between the related persons of opposite sex within one generation shows a variation that does not appear in other islands. The avoidance is called *kainga 'aka ma* (relations who are ashamed). It is observed

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only between the children and descendants of the opposite sex of a brother and sister: that is, cross-cousins and their descendants observe this avoidance with those of the opposite sex, within their own generation, as long as the original brother and sister are remembered as forebears. Avoidance is not practiced between true brother and sister. This fact was insisted upon by informants, in spite of repeated questioning. Another term for brother-sister avoidance was given as *wale atua* (house of a god), the term also given for the daughter of elder or eldest brother.

I was later told that both parallel-cousins and cross-cousins observed brother-sister avoidance. The elimination of brother-sister tapu between true brothers and sisters and emphasis of first cousins, all of whom are termed collectively *taina* (sibling) with no distinction between parallel- and cross-cousins, may be due to a psychological attitude. Brother-sister avoidance is generally based on the prohibition of sexual relations between brother and sister and all those termed brother or sister. It may be that as incest between true brother and sister is so obviously repugnant, the emphasis of the tapu was laid upon those between whom sexual intercourse was more likely although forbidden by native custom.

Lineal Descent

Hutchin (6, p. 173) says: "The people reckon their descent (*poripori*) from the mother's side." This is only partially true. In succession of rank, age is the determining factor; but the position is always held by a male. The son of a woman has priority over her brothers if she is older than they. The children are divided between the mother and the father. Before birth it is decided to which parent a child will belong. From this parent the child receives his inheritance in land and personal property and at death he is buried with the parent. The child becomes a member of this parent's kindred. Thus some Pukupukans reckon descent through the mother's side.

Tribes

Hutchin states that there are tribes and subtribes in Pukapuka. The four most important tribes are: Te Ua-ruru, the most ancient tribe and descended from an ancestress named Te Raio; Te Mango, second oldest tribe; Te Uira; and Te Kati.

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Governing Classes

The highest chief is the *aliki*, who is referred to today as "king" The present *aliki* is a figurehead, much of his power having been taken over by the village council (*komapani*), the Resident Agent, and the native pastor, who perform new functions in the island society.

The second class of chiefs is termed *mataiapo*, but I believe this is a recently adopted Cook Islands term. Formerly all chiefs were called *aliki*. At present there are four chiefs of *mataiapo* rank in Ngaki, two in Loto, and four in Iato. Each section of the village has also two lesser chiefs (*langatila*).

A council of the village elders (*tupeli*), the modern *komapani*, governs the people with the *aliki* and other chiefs. They settle all business and disputes concerning the village as a whole, determine the times for gathering food from the plantations, and superintend the distribution of food. In ancient times the council directed and trained the young men of the village. The eldest man (*wola*) is the council head and ranks next to the *aliki*. The final decision in government and council matters rests with the *wola*. Members of the council live together on a marae on the village center or meeting ground.

Each section of the village also has its council (*ekaresia*) and council house (*uipaanga*). Each council has a head man (*olomatua*). These names were given by an Aitutaki boy who first gave *kare* as the term for the head man and then corrected himself, saying that *kare* was an Aitutaki word. *Ekaresia* also may be an Aitutaki word.

Age Groups

The leading group of the village is composed of the old men who form the council. At their age they can retire from active manual labor and let others provide for their families. They fish a great deal, but this is done for sport. The adult men who are juniors to them are classed as *mulivaka*. They are the married men with families to provide for and live in their own homes. When the boys of the village have been accepted as men (*'akatane*), they are classed as *kivatangaloa*. In former times this transfer to the older age group was marked by permission to don men's dress, the malo.

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Younger boys who have not arrived at an age to be initiated into manhood are *kulamoemoe*. Infants are *kulapuputi*.

Frisbie (3) gives three periods in the life of an individual, which roughly correspond with the age groups given above: the first period (*takaua*), in which the child is unclothed; the second (*malo*), in which the individual is mature or is classed as an adult; the third (*matua*), in which the individual becomes a parent or a member of the eldest group of society.

The council formerly decided the time when the boys and young men of the village might be accepted into the group of men. Their approval was given when they judged that a boy was able to take care of himself and to procure food. Ability in fishing, gathering and husking coconuts, and handling a canoe were deemed more important than the mere fact that a boy had reached the age of adolescence. He had to become well grown, sometimes 18 or 20 years of age, before he was physically able to pass the tests and take part in adult life. Until this time the boy lived in his parents' home.

When the council decided that a group of boys or young men was ready to be elected into the group of men, the boys were assembled and ordered to accomplish several tests which would prove their abilities:

> For several days or weeks the boys took the canoes to sea to catch king-fish (*pala*). Each night they returned to the village council with their catch, which was divided among the families of the village. When they had proved their ability at sea as canoemen and fishermen, they had to gather coconuts for all the people. The first day they went to Motu Kotava and harvested until late in the day. With their canoes filled, they returned to Pukapuka. On nearing the canoe beach, the strongest wrestler of their group stood in the bow of his canoe and challenged the men on shore to a match. When he went ashore he met the champion of the *'akatane* group. If the wrestler of the candidates defeated his opponent, the entire group of candidates was acknowledged fit for acceptance as men in society. However, on the second day the group was obliged to return across the lagoon to Motu Ko and bring another load of coconuts. After this the boys were given malos to wear and were sent to the young men's house (*male lopa*) to live as recognized adults (*'akatane*).

The boys considered capable of taking care of themselves (*'akatane*) were eligible to marry. However, marriage did not necessarily take place immediately. A young man must select his mate and make the proper arrangements with the girl's family and his

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own. Complete freedom was not allowed formerly between the young men and women of the village. The young girls were quite restricted and the girls' houses were carefully supervised. Nevertheless, the young men found opportunities to meet the girls and sexual relations often occurred before marriage. There was no test before marriage to prove chastity, as in Samoa.

Today boys are allowed to become *'akatane* much earlier than was the custom formerly, and at 9 or 10 years of age they may be classed as men. The school teacher reports that this is a cause of much trouble within the school, for an *'akatane* pupil can attend school as he chooses and can not be subjected to punishment by his parents or the school. This is partially the effect of missionary teaching, which has taught the natives to put clothes on their children very early in life. The result has been that the natives look upon the children as having the rights of men and women some years before puberty. Restrictions in sexual continence have lost force in the new social state with church and government rule, and now little check is placed on a young man's having relations with as many women as will grant him their favors. This freedom, as described by Frisbie (3), certainly did not exist in aboriginal Pukapuka society.

Formerly girls were given the coconut-leaf skirt (*titi*) at an earlier age than the boys received their malos. When a girl donned her kilt and was considered a woman, she went to live in the house for unmarried women. These girls' houses have been disbanded as far as possible by the government because of the sexual license and number of illegitimate children that resulted under modern conditions among the young people living away from their homes.

RELIGION

Gods

The gods (*atua*) of Pukapuka were grouped in three classes: the supreme deity of the people; the gods of nature, who lived in different parts of the island and watched over the sources of food and controlled sickness and evil; and the gods who were deified men.

The highest god (*atua nui*) was Mata Aliki, who appeared in thunder and lightning. He sprang originally from a piece of coral and from the coral created the island of Pukapuka. The original piece of coral now forms part of the western shore of Pukapuka

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Islet. The ranking marae of the island belonged to Mata Aliki. There the people prayed to him, believing that he would fulfill their prayers when other gods failed. Coconut leaves were laid on the marae before the prayers were made.

The *atua punupunu* were gods representing different phases of nature. Laupapa was the name of an *atua punupunu* for the eastern side of the island. Mangamanga was the god of sickness and evil. Talitonganuku was the god of the ocean and sharks. The god of hurricanes and waterspouts was Tumailangi, who created the barracuda, swordfish, marlin, garfish, and all the fish with long pointed jaws.

Two gods especially important because they controlled the food supply of the island were Matalolau, god of coconuts, and Mataloamea, god of taro. Each of these gods has his own marae.

The third class of gods, *atua tangata*, was composed of lesser ancestral gods who were worshiped by tribes and groups of people. In the main, they appear to be connected with the island mythology. Taua, a goddess, was worshiped by the two foreign warriors who killed the mythical Manava Nui. This goddess had surveillance over the gods and the people of Pukapuka. A second *atua tangata* was Te Akuaku, a foreign god, who came from Akalava (Mangaia?) and was accompanied by another god, Ngalieeu, who came from Samoa to settle in Pukapuka. One marae in the village was devoted to these two gods. A fourth god was Malangatsiale, of whom nothing is remembered.

Some of the people had stones which they worshiped, but this practice was confined to certain families of the village. No fish or birds were worshiped or considered tapu to kill or eat, though the turtle was sacred. When a turtle was caught it was brought to the marae and presented to the council and was then divided among all the families of the village by a specially appointed man. The entrails were retained by the council. It was tapu for any man outside the council to eat these parts of the turtle. To disobey this tapu made the offender's hair turn gray and his testicles swell.

It is evident that the people had idols and images of gods and some religious paraphernalia, for Gill (4, p. 180) speaks of the "pile of rejected gods and instruments of priestcraft" which was presented to him when the natives abandoned their heathen religion.

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Priests

Each god had his priest or prophet (*tangata wai atua*) who had charge of the marae (*aoanga*) and officiated at the ceremonies held for the god. Individuals made their requests and prayers to the god without the intercession of the priest. There were also prophets, or shamans, whom the sick called upon to induce the gods to relieve them. The shamans addressed the gods, who replied through the medium of these men. The priest of the god Taua had power to curse people and bring sickness upon them. According to Gill, the sacred men brought sickness upon people who offended them or their gods. They suspended soul traps over the offender's house at night to snare his soul. The traps varied in size for large and small souls. The priest watched, and if some bird or insect passed through the loop it was thought to be the offender's soul. These soul traps were used also to discover whether a man would recover from sickness. Gill (4, pp. 181-182) writes of

> . . . two soul traps (*ere vaerua*) consisting of a series of rings twisted in a cocoanut fiber and arranged on either side of a long cinet [sennit] cord. One soul trap was twenty-eight feet long, the other fourteen feet. Some of the loops are large, others small . . . The demon, Vaerua, or "spirit" presiding over the spirit world, was believed to hurry off the unlucky soul to the shades to feast upon. It was speedily known throughout the island that so and so had lost his soul.

The priest explained to the offender's family that some offense had been committed against a god. To save the culprit, the family attempted to propitiate the priest with large gifts of food and property to insure his intercession with the god of the land of the dead. If the priest could not be prevailed upon, the culprit died of distress, for it was believed that a man without his soul was a mere shell doomed to expire.

Land of the Dead

The spirit or soul of man departed from his body before actual death and traveled to the land of the dead, Po Likuliku (The place-to-lie-down). This land had a second name, Te Aotakotoloa, which was rarely used. It lay over the horizon to the west of Pukapuka. Ko Leva, a goddess, ruled over the spirit land and the souls that lived there. Under a rock she had a house (*wale o Leva*) built with thousands (*tsinitsini*) of posts. Each soul came to this house when it

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entered the land of the dead and was assigned a post before which it was to sit. Here all the spirits joined in eternal chanting. On the top of her house Ko Leva had a trap in which she caught the wandering spirits of the dead. In her house she had mats which were hung around the walls. If any spirit wandered from its body on Pukapuka and went inside these mats, it could never return and the body would die. The soul is *vaelua*, a term meaning "divided in two parts" in Samoan dialect (10). It has also a second name, *mauli*, the Tahitian term for "ghost or spirit" (16).

It was believed that the spirits lived as people of the island did, and that many of the arts practiced by the Pukapukans were learned from spirits. The making of sennit and the plaiting of lauhala malos were learned from the sennit and malo dropped by two spirits found wandering about Pukapuka. Spirits also brought to Pukapuka the trap that stood on the roof of Ko Leva's house. This was kept on the island until it was presented to some early missionary. According to Frisbie, the birds of Tema Reef between Nassau and Pukapuka Island were considered to be the souls of ancient inhabitants of the two islands.

STONEWORK

Maraes

Every god, including the family gods, had his own marae (*aoanga*) where he was worshiped. The maraes were enclosed by rectangles of coral slabs laid on edge and had a coral slab erected on each. Bunches of coconut leaves (*'iele*) were wrapped around these monoliths when prayers and ceremonies were conducted. No other offerings or human sacrifices accompanied the religious ceremonies. Before each fishing expedition the fishing gods were prayed to and *'iele* were wrapped around the sacrificial stones.

Two stone structures called *watu no'o i Manava Nui* (stone seats of Manava Nui) stand on either side of the bend of the southeastern coast of Motu Koe Islet, high above the sea on a coral embankment washed up by the waves (fig. 2). A tidal wave in 1914 partially destroyed them, leaving only two or three slabs to mark their position.

The western and smaller structure has only two remaining slabs; one is erect and one lies flat on the ground with an end against the base of the other. The slab lying flat on the ground is all that remains of the "seat," and it faces the sea. The second structure, east of the bend in the shoreline, faces inland. It was made of eight or more large coral slabs which now lie scattered about

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on the ground. The arrangement of slabs was demonstrated by a native (fig. 2). Two erect slabs formed the back, two horizontal slabs the seat, and slabs at each side the arms. The position of other slabs lying scattered on the ground suggests that they once stood on edge and formed a low enclosure. 324

These "seats" were built by the Eaki people who came to Pukapuka after the first settlement. In the legend of Manava Nui they were the places from which he watched for fish and turtles. The inference is that the Eaki used these structures as maraes for offering turtle and fish to the gods; their priests may have used the erect slabs as backrests, as was customary in the Tuamotus (2). 177 178

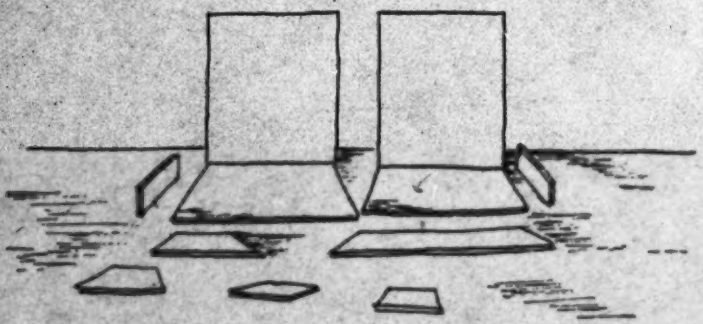

FIGURE 2.—Eastern stone "seat" of Manava Nui, sketch made from a miniature seat constructed by a native Pukapukan.

GRAVES AND BURIALS

The dead were formerly buried in the marae (*aoanga*) of the village. Due to a government order the maraes have been abandoned and houses have been built over them. It was difficult therefore to determine their number or boundaries or to learn their exact purpose in the former life. Some contained graves; others had graves near them. The burial ground of the *ariki* is still preserved. It is now used as a modern cemetery and contains graves of both pre-Christian and Christian times (pl. 1). The coral slabs that once marked the graves of an ancient cemetery at the western end of Aonga on Motu Kotava Islet were washed into the sea by the tidal wave of 1914. 000

On the southeastern shore of Motu Koe Islet are the graves of two Pukapuka warriors, Tuanua and Titake. Both these graves were dug in pre-European times. That of Tuanua remains intact and is

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a

b

FIGURE 3.—Ancient grave forms: *a*, grave of Tuanua, rectangle 12 feet 8 inches by 4 feet 9 inches; head slab 2 feet 7 inches high; *b*, grave of Taupeloa, Tongan or Samoan warrior who settled on Motu Koe Islet.

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a good example of native graves (fig. 3, *a*). It consists of a rectangle of seven coral slabs set on edge, a headstone, and a footstone. No mound marks the place of burial, but the coral rubble covering it is finer and smoother than that around it and shows that it was carried from the beach. Old graves in the cemetery follow this type of construction. The slabs composing the rectangles vary in number and are sometimes set on end rather than on the side. The headstones differ in shape (pl. 1).

Two peculiar grave types exist as boundary markers between Iato and Loto. They are the graves of Tokaipole and Taupeloa, two legendary figures from another island, who appear in the tale of Manava Nui. The grave of Tokaipole, situated behind the church on the boundary between Iato and Loto, is made of rectangular slabs 6 to 8 inches high, set on edge in a rectangle 6 feet by 5 feet 2 inches. The grave of Taupeloa (fig. 3, *b*) is like the ordinary grave with headstones, but it has also a surrounding rectangle of low coral slabs standing 10 inches above ground. No other graves are associated with these two.

It was the custom for the family of a dead person to build a shelter near the grave of the deceased and to dwell on the burial ground for a certain period. With them lived those relatives of the dead who had handled and buried the corpse. This isolation from the rest of society cleansed them of the contamination which they had contracted from association with the dead.

A necklace of the pearl-shell lures used in bonito hooks was hung around the neck of a chief or man of importance at death. While digging post holes the Resident Agent has unearthed several graves containing these necklaces. According to information learned by Norton Stuart, naturalist on the *Zaca*, a man's canoe was disassembled and stored in a shelter by his grave. Several small shelters with parts of canoes stand near the cemetery at the present time.

FISHING

Fish are plentiful in the lagoon, reef, and outer sea. Seines and hand nets are used in shallow water and lines in the deeper parts of the lagoon and outside the reef. Small fish are caught with single-piece shell hooks, large deep-sea fish with two-piece wooden hooks, and bonito and smaller fish with composite shell trolling hooks on

line and pole. Night fishing is done with dried-leaf torches and hand nets or spears from canoes or while wading along the reef. Fishing is primarily the business of the younger men, but women comb the reef for squid and sea food, catching small fish by driving them into nets along the shore.

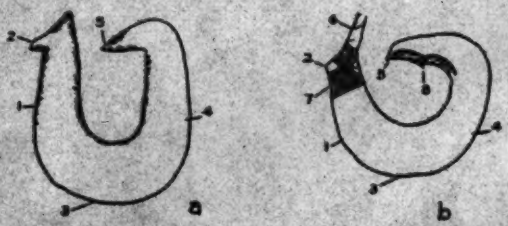

FIGURE 4.—One-piece shell hooks: *a*, U-shaped hook, greatest length 5.2 cm, greatest width 4 cm, greatest thickness of shell 0.6 cm, point clearance 0.7 cm; *b*, circular hook, greatest length 3.8 cm, greatest width 4.4 cm, greatest thickness 0.8 cm, point clearance to snood lashing 0.7 cm. 1, shank; 2, knob; 3, bend; 4, point leg; 5, point; 6, snood; 7, snood lashing; 8, barb.

ONE-PIECE HOOKS

Two types of one-piece pearl-shell and turtle-shell hook are known from Pukapuka; one is U-shaped, the other circular (fig. 4). Both types are made from flat or irregularly shaped pieces of shell and are polished. In both the shank has a lashing knob on the outer edge.

Four hooks in Bernice P. Bishop Museum have corded snoods lashed along the inner edge to the shank by a fine twisted thread of *wau* (hau) which is bound alternately above and below the lashing knob in successive figure-eight turns. The points of the U-shaped hooks stand at right angles from the point legs. The points of the circular hooks are barbed on the inner edge of the point leg. Between point and barb the edge is beveled and concave and is set at an angle from the inner curve of the hook. The inner edge of the barb is cut at right angles to this inner curve.

BONITO HOOKS

The composite hook of pearl-shell lure and the bone and turtle-shell hook is used with line and pole for trolling from canoes for bonito (fig. 5).

The lure (*pa*) of the bonito hook is made of pearl shell highly polished to reflect light when skimmed over the surface of the water. It is cut radially from the shell, the hinge forming the raised head and the lip forming the thin body. The head is perforated for a lashing to secure the snood. The hook (*manga*) is lashed at the tail of the concave surface. The shank of the hook is perforated or grooved for the lashings (*linganga*). If there are two per-

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forations, the snood (*alaala*) is secured to the proximal one. If there is no proximal perforation, the snood is secured around the base of the hook. A hackle (*akamaunu*) of pig bristles or cord is secured on the back of the lure by the hook-lashing through the distal perforation. Two hooks have filler sticks (*tuaniu*), made of pieces of coconut leaflet midrib, along either side of the shank and under the hook lashings. These filler sticks steady the hooks on the lures.

The details of the manufacture of these hooks have been thoroughly described by Buck (13) and by Kennedy (7). The making of a hook was not seen during my visit to Pukapuka, but

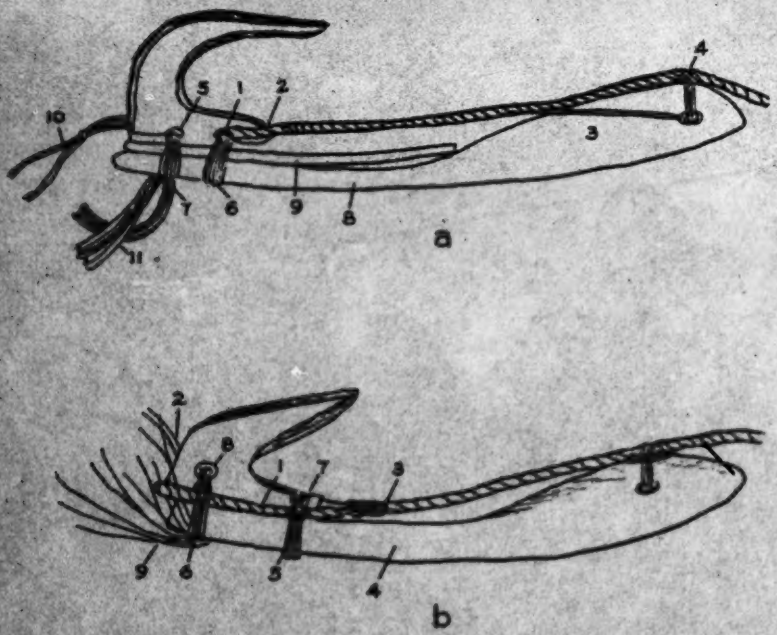

FIGURE 5.—Bonito hooks: *a*, western type, shank of hook has proximal hole (1) through which snood (2) passes; snood is seized by lashing *tau matila* (3) from shank head to lure head, where it is lashed in figure-eight form (4), in hole of head; hook has two holes (1, 5) for lashings (6, 7) to lure (8), which include filler sticks (9); distal hook lashing (7) carried behind and knotted as part of hackle (10); hackle (11) of threads knotted at ends lashed in distal lashing (7). *b*, eastern type, snood (1) looped around base of hook (2) and spliced (3), hook secured to lure (4) by lashings, proximal, (5) over groove (7) of hook shank and distal (6) through hole (8), hackle (9) lashed to distal lashing (6).

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presumably the method follows that of Samoa and the Cook Islands. In shape and size the hooks vary greatly. The eight Pukapuka bonito hooks (*pa'i atu*) in Bernice P. Bishop Museum range in length from 4 11/16 to 2 7/8 inches.

Among Pukapuka bonito hooks are examples of both the western and the eastern Polynesian types, distinguished by Buck (13, p. 194) as follows:

> The western type may be divided into two divisions according to the method of attaching the snood to the point. From the western limits of Polynesia as far east as Pukapuka the snood is attached to a hole in the base of the point. In the eastern part of the area in which the western point is found, the snood is formed into a loop which passes around the base of the point, as seen in Manihiki, Rakahanga, Tongareva, and Fagatau.

Four of the eight Pukapuka hooks have the snood attached to the proximal hole of the base or shank which characterizes the hooks found from Samoa to Pukapuka; and four have the snood carried around the shank of the hook, as in hooks from the northern Cook Islands and Fagatau. As the following description shows, the Pukapuka hooks (fig. 5) have features other than the snood attachment, which make the two types more diverse than Buck's classification suggests:

> The four Pukapuka hooks which have the snood attached to the proximal hole of the shank also have an even curvature of the bend of the hook, the point tapering gradually and horizontally to the shank. One hook is pronouncedly curved and the point tips downward toward the shank. The inner curve of the hook is quite rounded or open. The edge of the back and the inner curve of the bend is rounded or beveled. The shank has two perforations. In three hooks the shank is lashed through each hole with a separate lashing thread; in a fourth, with a continuous piece of thread. The hackle is made of short pieces of line knotted at each end and secured under the distal lashing of the shank which crosses it in a figure-X pattern. The snood is run through the proximal hole and doubled back on itself and seized. The seizing thread of the snood is run first through the hole in the head of the lure and then through the proximal hole of the shank, where it is seized about the snood and finally carried to a point on the line above the lashing of the snood to the head of the lure. In one hook the seizing covers the part of the thread passing from the head of the lure to the shank; in the other three hooks it alternately covers and exposes this part. Two of these four hooks have filler sticks along the shank of the hook and included with it under the lashing. The sticks in one are long, reaching to the head of the lure; in the other they are shorter and extend about half-way to the head. On the back surface of three lures is cross-hatching, like fish scales in appearance, which keeps the lashings from slipping. The heads of the lures are rounded on the sides and top, but the hooks are very imperfect and the assumption can not be made that this is a definite characteristic of this type of bonito hook.

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The four hooks which have the snood carried around the shank of the hook have a groove at the end of a broad, tapering shank for the proximal lashing to the lure. The inner curve at the bend is sharp and runs obliquely to the point. The distance between the point and the head of the shank is relatively wider than in the first four hooks described, and the curve at the bend is more angular. The upper edge of the point and the back edge of the bend are almost straight, turning sharply at the base. The outer edges are filed flat; the inner edge is slightly rounded or beveled. The hook is decidedly thicker and more angular. The lashing groove of the shank appears to be necessary because of the style of tapering the head of the shank and does not appear to result from a broken boring, which Buck gives as the possible origin of the grooves in the hooks of Tongareva and Manihiki. The groove also appears in the Fagatau hook, which Buck believes to be the original form of bonito hook with the proximal prolongation of the shank. The end of the snood, looped about the bend of the hook, is spliced just above the head of the shank. No seizing thread runs from the head of the lure to the point of splicing. The snood is secured to the lure with a lashing run several turns through the hole of the head and over the snood, wound about itself several times between the head and snood, and secured. The sides of the head of the lure are flatter and meet in a sharp ridge, which is only slightly rounded in profile. A median notch is cut longitudinally on the back of the tail on two hooks of this type; two double notches are cut on a third. These notches are to allow the lashing thread of the hackle to be slipped under the distal lashing to which the hackle is lashed. The hackle is made of pigs' bristles, which according to Buck have supplanted coconut-husk fiber in Manihiki hooks, and secured on top of the distal lashing. The edges of the lure have two notches on each side at points opposite the lashing groove and perforation of the hook for receiving the hook lashings.

The chief differences between the two classes of Pukapuka bonito hooks may be summarized as follows:

	Class 1 (Samoa to Pukapuka)	Class 2 (Manihiki, Rakahanga, Fagatau)
Fork of hook	U-shaped or rounded	V-shaped or flaring
Bend of hook	Flat	Rounded
Lashing attachments of shank	Two holes	Hole and groove
Attachment of snood	To proximal hole	Around base
Securing of snood	Seized	Spliced
Notches for hook lashings	Absent	Present
Slot for hackle lashing	Absent	Present
Cross-hatching on lure	Present	Absent
Filler sticks	Present	Absent
Hackle attachment	Lashed under distal figure-X lashing of shank, has secondary hackle formed of ends of distal hook lashing	Lashed to distal lashing of shank

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Malau Trolling Hooks

Three trolling hooks (*pa taki malau*) for fishing for *malau* from the reef are in Bernice P. Bishop Museum (fig. 6). They range in length from 1 to 2 3/8 inches. Their type and construction are like the western type of bonito hook except for the absence of the raised head of the lure, which is cut from a thin flat piece of shell. In place

Figure 6.—*Malau* trolling hook: *a*, lure (1) with seizing (2) thread of snood (3), which also makes lashing to head (4), continues as seizing (5) to hook (6) and passes to proximal hole (7), making lashing, passes on to distal hole (8) and makes second lashing, and then securing hackle (*takele mauma*) runs around bend of hook and loops back so and is knotted as in secondary hackle (9). *b*, lure with grooved head and flaring tail.

of the hole through the head of the bonito hooks, a notched projection is left at the head of these small lures and the snood is lashed to this. The snood attachment to the hook is made at the proximal hole in the shank. The hook is the rounded type and is made of turtle shell. The seizing of the snood and the lashing of the hook and hackle are done with one thread.

In one hook the seizing is begun at the head by a thread which includes the lashing to the projection of the lure and is continued as the seizing to the hook. From the snood it is passed through the proximal hole in the shank, lashing the hook to the lure; it is wound once around this lashing and passed back to the distal hole, making the second hook lashing. Finally it is wound once around this lashing on one side and passed around the bend of the hook and wound around the lashing on this side. It is then knotted at the bend of the hook forming a small secondary hackle. The main hackle of *tau* fiber is secured on the back of the lure by the distal lashing, which is bound over it in a figure-X pattern.

In a second hook the seizing and lashing thread is begun with the proximal lashing of the hook. The end is secured on the right side, and a turn is taken on the left. The thread is run back to the distal hole, and the distal lashing of the hook to the lure is made, also securing the hackle. The thread is then passed forward under the proximal lashing to the snood. The seizing and lashing to the head of the lure is made and the thread is secured in the end of the seizing.

Wooden Hooks

Two types of two-piece wooden hook are used for catching *Ruvettus* (*palu*), *pua*, and other deep-sea fish. They are made of tough wood from a section containing part of a stem and branch. One type, the *kaupalu*, has a U-shaped crotch and a point made of a forked branch attached to one leg. The second type, *'iawe* (or *thawe*), is made from two forked branches with V-shaped crotch (fig. 7).

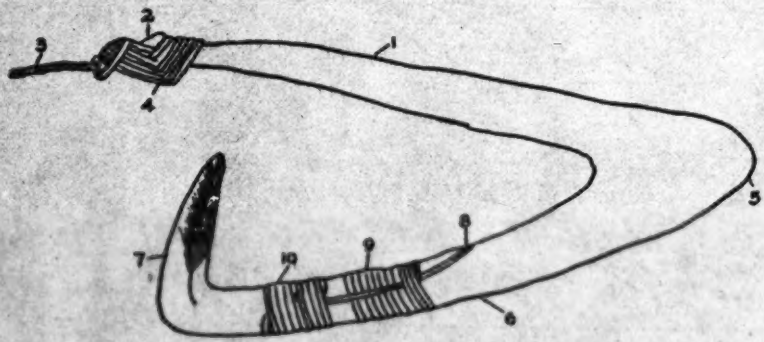

Figure 7.—Wooden *Ruvettus* hook (*'iawe*): 1, shank; 2, knob; 3, snood; 4, figure-eight lashing in descending pattern; 5, fork of main piece; 6, point leg; 7, point at about 40-degree angle to point leg; 8, lower end of scarf joint on inner side of point leg; 9, first section of point lashing; 10, second section of point lashing. Measurements in centimeters: length of shank, outer, 12.5, inner, 9.5; length of point leg, outer, 12.5, inner, 8; clearance of point and shank, 1.7; maximum thickness, shank 1.1, point leg, 1.2, fork 1.6; maximum width, 6; length of point, outer, 3.5, inner, 2.5.

The U-shaped hook is made of *tsiale* (*Gardenia tahitiensis*). In the only hook of this type seen on the island the point had been broken and the end of the point leg had been whittled into a point like a barbless European hook. The shank leg had a single seizing knob cut off-center from the vertical plane of the hook. This hook is said to have had formerly an attached point like the V-shaped hook.

The V-shaped hook is made from the fork of a stem and branch of *ngangie or nangaie* bush (fig. 7). A branch, diverging at approximately a 30-degree angle, is selected and cut off an inch below the fork and a little over the length desired for the hook above the fork. The base of the fork is thinned and tapered into a lobe. The stem is used for the shank, which is cut down at the end to much less thickness than the rest of the hook, having a single knob for lashing the snood on the outer surface. The two surfaces of

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the legs facing each other are termed "inner"; the surfaces facing away, "outer". The point leg is cut off shorter than the shank, and a long oblique scarfing is made along the upper half of the inner surface.

The point is made from a forked piece with an angle of approximately 40 degrees. The point is cut with two surfaces; the upper is quite convex, the lower slightly convex. The leg of the point is scarfed on the outer surface to fit the scarfing of the point limb. The two pieces are bound with a light piece of sennit braid. The lashing commences at the center of the joint and is bound downward to the lower end. The first three turns are passed over the end of the sennit. The last two turns are left loose and the long end of the sennit is thrust under these and drawn tight, thus securing the free part of the sennit. This end is carried to the top of the scarf joint, and a second section of binding is made down the leg to within a fourth of an inch from the lashing commencement. The last binding is wrapped over the piece that runs from the lower section to the top. The last four turns are left loose and the end of the sennit is tucked under them, pulled tightly through until the four turns are fast, and cut off.

The snood of sennit is laid along the inner side of the head of the shank and lashed to it by a light piece of sennit in figure-of-eight pattern, binding in descending pattern. The crossing is made on the inner face, and the loops are made alternately above and below the knob.

CANOES

The Pukapuka canoe has a long, thin, streamline hull with pointed nose and tapering stem. Its design is copied from a long, slender type of fish. The long bow, formed of the underbody and bow cover, broadens very gradually and deepens from the short, thin cutwater into the full roundness of the canoe. The keel extends with a slight, graceful curve from forefoot to stern, where it rounds more sharply to the stern cover. This piece, shaped like a fish's tail, extends with a slight upward tilt beyond the stern of the underbody.

The canoe underbody is composed of sections of tree trunks. It has washstrakes, bow and stern covers, and a single outrigger with two or more booms connected by stanchions to a float. Each canoe is fitted with seats, carrying bars, and a brace for a fishing pole. The usual fishing canoe has three sections in its underbody and two outrigger booms. One canoe, 60 feet long, seen in the lagoon at Pukapuka, has extra middle sections of the underbody, extra outrigger booms, and a second mast.

No trees on the atoll are of sufficient length and breadth to make a single dugout for the hull of a fishing canoe. Sections of proper breadth and straightness are cut from the *akanava* tree. They are hollowed out and lashed end to end. The woods of *puapua* and

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uetau are said to be used also in canoes. *Puka* is used for the outrigger float.

The following notes are based on a canoe in Bernice P. Bishop Museum which is typical of the fishing canoes of Pukapuka (fig. 8). The structure of this canoe is identical with that of the canoe sketched in detail at Pukapuka by Toshio Asaeda of the Crocker Expedition (figs. 9, 10).

The length over all is 23 feet 4 inches and the beam of the underbody 1.25 feet. The maximum beam of the hull is several inches below the horizontal edges of the sections, which in the center section are 9.5 inches apart. The middle section is well rounded with only a slight definition of a keel. The bows and sides of the stern are less curved and the keel is sharp. The port bow and the starboard side of the stern are slightly flatter than their opposing sides; the bow keel is slightly to starboard, and the stern keel slightly to port of the longitudinal axis of the canoe. The middle section has a slight concavity on the port side. This may be due to the natural shape of the tree, which could not be overcome in shaping the section. The beam of the center of the section is less than at either end. This asymmetry is slight and apparently results from crude workmanship, for if it were intentional, to offset the drag of the outrigger, it would take just the opposite form, as Kennedy (7, p. 94) has described in the asymmetry of hulls of Vaitupu canoes.

The joined ends of each section are squared off and lashed together with sennit run through opposing pairs of holes along the adjoining edges. The lashing is done with a single line and is commenced at the first pair of holes under one gunwale. Two turns are made and tightened; then the sennit is carried diagonally across to the pair of holes below, two turns are taken, and the process is continued. When the pair of holes under the opposite gunwale is reached, the lashing is returned again to the commencement pair, taking two turns again through each pair of holes. The lashing is carried diagonally from one pair of holes to the next, making a crisscross pattern over the inner seam between the sections. No calking is used between the sections of the hull.

The washstrakes are made of two planks on each side, lashed to the edges of the hull sections. They are set with an outward flare from the edges of the underbody sections, the distance between gunwales (1 foot 1 inch) being slightly less than the beam of the underbody. The forward planks of the strake overlap the after end of the bow section and are joined to the ends of the bow cover. The after planks slightly overlap the after end of the middle section and extend three fourths of the length of the stern section. They are joined to the ends of the stern cover.

The ends of the washstrakes are lashed to the adjoining pieces with sennit braid. Three pairs of holes are drilled in the two ends, and the sennit is drawn three times through each pair and then carried below to the next pair. The lashing of the top pair is carried over the gunwale and across to the opposite hole, through this, and then over the gunwale and back to the first hole again, making a triangular binding. Under the lashing of the inner side of the ends joining a lauhala calking is laid.

The thickness of the underbody side is 1.5 inches, twice that of the strake. The lower edge of the strake is set on the edge of the underbody with the

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FIGURE 8.—Two-boom canoe from Pukapuka in Bernice P. Bishop Museum. Sketched by Ruth Hyatt.

FIGURE 9.—Six-boom canoe. *a*, view of starboard side: 1, bow section of underbody; 2, middle sections; 3, stern section; 4, washstrake; 5, foresection of bow cover; 6, after section of bow cover; 7, lookout seat and wave guard of after section of bow cover; 8, stern cover; 9, wave guard; 10, stern cover cleat; 11, bar rest for fish pole; 12, stern lifting pole; 13, stern outrigger boom; 14, bow outrigger boom; 15, outrigger struts; 16, middle boom. *b*, top view: 1, bow-cover sections; 2, stern cover; 3, gunwale; 4, gunwale or upper edge of underbody on which washstrake rests; 5, outrigger boom which extends in large canoes beyond starboard side; 6, outrigger float; 7, strut running to (8) stringer; 9, seat with hole for supporting mast; 10, stanchions connecting boom (5) with float; 11, brace between boom (5) and float.

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outer surfaces flush, leaving the inner part of the underbody edge uncovered. A calking of heavy coir cord, backed by a thin rod or split of coconut-leaf midrib, is laid on this edge tightly against the seam between the strake and underbody. The lashing of the strake and underbody, bound through pairs of opposing holes, presses the rod against the coir calking.

The long bow cover is made in two sections in order that the canoe-maker may reach through the narrow interior of the head to make the forward lashings to the underbody. The fore section of the bow covers about one third of the bow section (fig. 10, *c*). This end is pointed to complete the cutwater of the section. The top surface has a median ridge which diverges into a slightly inclined surface which is continued on the after section of the cover. This section rises to the height of the washstrake to which it is joined. In the middle of this incline is the lookout seat and wave guard, a slightly concave block whose sides flare outward. The upper surface of the cover is open behind the block. Midway across the two sides is lashed a short, stout bar for lifting and carrying the bow of the canoe. A calking of sennit is placed between the after part of the cover and bow section. Light rods are lashed tightly along the outer seam between the cover and underbody.

The stern cover rests on the last third of the stern section. The forward end of the cover is open, and the sides join the after ends of the washstrakes (fig. 10, *b*). The gunwales of the cover taper aft and slightly upward into a pointed and raised wave guard which in the small canoes is one piece with the cover. Behind this the sides of the stern cover taper into a projecting piece shaped like a fish's tail. A small cleat is carved on the back of the cover. The stern cover and section of the underbody have a calking of sennit between the edges; a light rod forms an additional calking over the outer seam.

The stern seat of the canoe is set between the washstrakes just forward of the joining with the stern cover. The under side of the seat is hollowed out, leaving a flange around the edge which is lashed at the two ends to the strakes. A V-shaped notch 1.5 inch deep is cut in the middle of the aft side of the flange, and holes are drilled at either side. A piece of sennit braid is run three times between the holes and seized, making a loop below the notch. A short bar, extending 2 inches beyond the gunwale on each side, is lashed across the stern cover 3 or 4 inches behind the forward end. This bar has a groove cut in the surface at an angle of 45 degrees from the top in which rests the bonito fishing pole; the tapered butt of the pole is held in the notch and looped under the stern seat. The interior of the tapered wave guard has a slight concavity for a bait used in fishing for kingfish or sharks. The stern cover is hollowed underneath as far back as the last lashing with the stern section. The edges are lashed together and calked in the same fashion as the strakes and bow cover.

A stern-lifting bar is lashed across the gunwales of the strakes about 4 feet forward of the fish-pole rest. Across the outer ends of the lifting bar and pole rest are two short poles, one on either side of the canoe, for lifting and carrying the stern of the canoe. The forward ends of the lifting pieces are also lashed to the boom, which is placed behind the cross lifting bar. The middle seat is lashed before the boom.

The forward boom is lashed across the strakes about 3 feet behind the opening of the hull. The bow seat is placed behind this.

The outrigger (figs. 8; 10, *e*, *f*) is composed of these two booms connected by stanchions and braces, a single-piece float, two struts, and a stringer. The

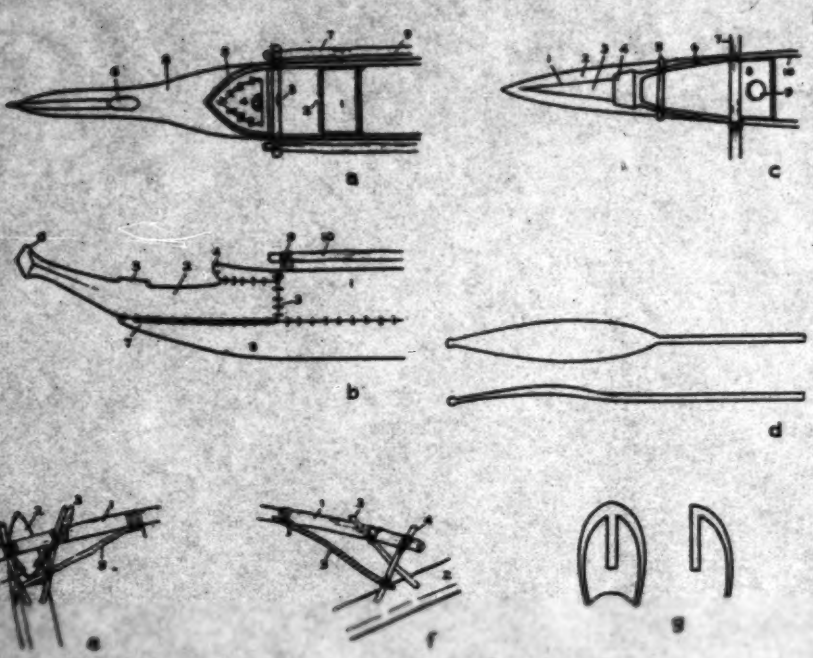


FIGURE 10.—Six-boom canoe: *a*, stern, top view: 1, stern seat; 2, groove under stern edge of stern seat for holding fish pole in place; 3, bar rest with groove for fish pole; 4, bait deck; 5, stern wave guard; 6, cleat of stern cover; 7, stern-lifting pole; 8, stern cover; 9, gunwale of washstrake. *b*, view of starboard side: 1, washstrake; 2, stern cover; 3, joint of washstrake and stern cover; 4, side piece of wave guard; 5, cleat; 6, tail of stern cover; 7, rod calking over seam between stern cover and (8) stern section of underbody; 9, bar rest for fish pole; 10, stern lifting pole. *c*, bow: 1, fore section of bow cover; 2, after section of bow cover; 3, deck of bow cover; 4, lookout seat or wave guard; 5, bow lifting grip; 6, lashing of end of bow cover to end of washstrake; 7, bow outrigger boom, lashed across gunwales of washstrake; 8, bow seat; 9, hole in bow seat for forward mast; 10, washstrake. *d*, canoe paddle, face and side view. *e*, outrigger boom, end attachment: 1, bow boom; 2, outrigger float; 3, inner pair of connectives, crossed over bow boom running obliquely outward to float; 4, outer pair of connectives similarly attached; 5, diagonal brace between bow boom and after connectives of outer and inner pairs; 6, suspensory brace, holding bow boom to float. *f*, middle-boom attachments of six-boom canoe: 1, outrigger boom; 2, outrigger float; 3, inner connective; 4, outer connective; 5, diagonal brace between boom and outer connective. *g*, canoe bailer, top view and longitudinal section.

float is flattened on top and pointed at both ends. Each boom is attached to it by four connectives, short sticks set obliquely in pairs in holes on the top surface and crossed above the boom to which they are lashed. A diagonal strut to stiffen the attachment is lashed across the opposing pair of connections between the booms and top of the boom. The connectives are set into the float without wedges or lashing. To insure keeping the boom and float together, a suspensory brace of sennit braid is bound between the two. The binding is commenced over the boom on the hull side of the connectives, brought across the side of the inner connectives and under the float, brought over to the boom outside the connectives, and continued with 5 turns under the float, 2 over the boom outside the connectives, and 3 inside the connectives. After the last turn over the boom, the sennit is brought back to the point of crossing above the float, given 2 turns around the crossing, then lashed 2 times up and 3 times down the upper and outer branch of the crossing of the brace, crossed over to the inner and upper branch, given 2 turns up and 3 down, and then secured.

Two struts are lashed across the gunwales and between the booms. The forward strut is set 8 inches behind the bow seat and extends 1.5 inch over the starboard side. It is securely lashed with sennit which runs to two pairs of holes. The second strut is lighter and does not extend beyond the starboard side of the hull. It is lashed through one hole in each strake. A stringer runs over the booms and across the port ends of the struts and is lashed to each of the four pieces.

Each fishing canoe has a rigging for sailing. A hole for the mast is made in the center of the bow and middle seats. The mast is set in either, according to the direction in which the canoe is being sailed, the outrigger being kept to windward. The mast rests on the floor of the hull. One informant stated that formerly the mast was lashed to the outrigger boom and that setting the mast through the seat is a modern practice. In a native's sketch of a sailing canoe (fig. 11) the sail and rigging are shown. The only sail seen at the island was a gaff sail, but the sketch gives a lateen sail. The mast is held by a fore stay lashed around the bow of the canoe and a back stay secured to the middle of the port strake. The shrouds are attached to the forward outrigger boom. A yard runs along the foot of the sail, and the sheet from the yard is attached to the after boom.

The 60-foot canoe which was seen in the lagoon at Pukapuka differs from the fishing canoe in the extra number of parts and supports and in having two masts (fig. 9):

The underbody is built of five sections, and the strakes are composed of four planks to one side. There are six heavy outrigger booms, all extending nearly 3 feet from the hull on the starboard side (fig. 9, *b*). The booms are lashed to the strakes and to the outside of the underbody by guys of sennit lashed over the booms and through a pair of holes in the tumble-home underbody outside the strakes, and inner guys are lashed around the boom and

through holes in the projecting edge of the underbody. The end booms are attached to the float by four stick connectives and a sennit brace, as described for the fishing canoe. The middle booms have two connectives, which are undercrossed. The after connective, like the after pair in the four stick connectives, runs obliquely to the boom. A diagonal strut runs from each boom to the forward connective. The outrigger is braced by six struts lashed across the gunwales—one between each pair of booms and two between the forward pair—and by connecting strings. Between the last pair of booms there are three stringers which make a platform for paddles or fishing gear.

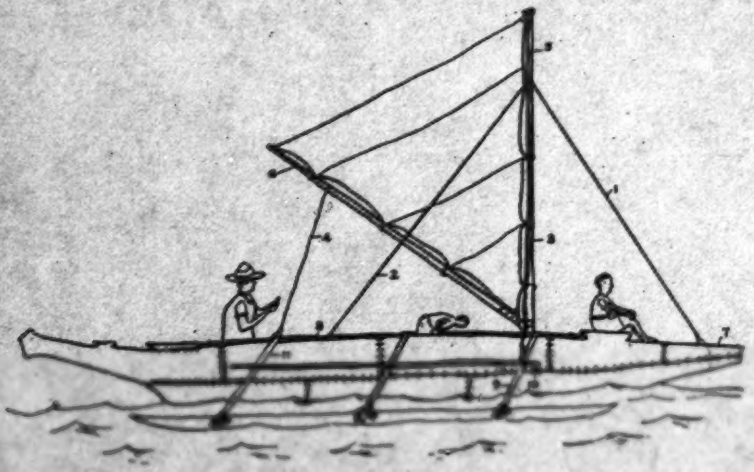


FIGURE 11.—Sketch of sailing canoe with rigging: 1, fore stay running from bow of canoe to mast; 2, back stay running from mast to washstrake; 3, starboard shroud from mast to bow outrigger boom and stringer; 4, sheet running from yard to stern outrigger boom; 5, mast set through hole in bow seat or lashed to bow outrigger boom, and set on floor of hull; 6, yard; 7, bow of canoe; 8, washstrake; 9, bow outrigger boom; 10, stringer; 11, stern outrigger boom. Drawn by a native.

The stern has no cross lifting bar, and the lifting pieces are lashed directly to the stern boom. The wave guard of the stern cover is made of separate pieces lashed to the cover (fig. 10, *b*).

The stern seat is between the fishpole rest and after boom and has the notch and loop for supporting the pole butt. Short planks or seats with holes for the two masts are lashed to the strakes behind the bow and fourth booms. The masts of this large canoe are stepped in cup-shaped blocks cut out on the floor of the underbody.

000 The Pukapuka paddle (fig. 10, *d*) has a particularly long, thin blade which tapers into a knob at the tip. The blade is protected by this knob when the paddle is used for poling the canoe over the shallows of the reef. Blade and handle are of equal length. The plane of the blade is curved; the back is convex and the face concave.

The bailer (fig. 10, *g*) of *akanava* wood is of the rounded sugar-scoop type with the handle projecting forward within the recess:

The top surface of the handle is flat at the base and flush with the rim. The handle is rounded at the end and in some bailers terminates in a knob. The top of the bailer is almost flat, the upper edges of the sides being a little concave. The bottom of the bailer is rounded, curving up in front and in back. The lip is beveled on the inner surface. The upper part of the lip inclines backward to the top. The bailer is 13 inches long, 7 inches wide, 5 inches high, and 1.5 inches thick. The handle is 8.5 inches long.

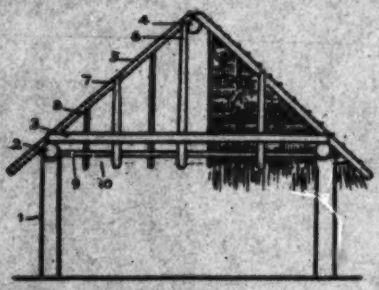
Canoe Terms

Canoe or hull: vaka.
Double canoe: vakalua.
Five-man outrigger canoe: 'iekelima.
Large double canoe: 'iekengaulu.
Port or outrigger side of canoe: ama.
Starboard side of canoe: katea.
Forward section: mua vaka.
Head of forward section: ululuia.
Middle section: ual.to.
Stern section: muli vaka.
After end of stern section: kalemu.
Joint of sections: tuta.
Fore cover: tuki.
Head of fore cover: talatuki.
Bow cover: puke.
Fore deck of bow cover: matau puke.
Bow wave guard and seat: malae puke.
After deck of bow cover: kauai puke.
Washstrake: oa.
Patch piece in strake: kamatila.
Joint of strakes: tuta oa.
Outside calking: 'iuki'iuki.
Inside calking: taka.
Seamit calking: kawa malo.
Stern cover: velo.
Tail-like projection of stern cover: laulauvelo.
Cleat on stern cover: talamoko.
Bait deck of stern cover: akakauvaeonu.
Cross-piece rest for fish pole: utsia.
Stern seat: no'oanga.
Forward lifting bar: manu.
After lifting bar: manu alua.
Longitudinal lifting pieces: palipali.
Outrigger float: ama.
Points of outrigger float: mata ama, linganga.
Outrigger boom: kaukau.
Stringer across booms: kiato.
Strut extending from connective to outrigger boom: aioka.
Connective extending from boom to float: tutuki.
Mast or spar: tila.
Sail: la.
Sheet: wawa.
Fore stay: tukuku mua.
Aft stay: tukuku muli.
Shroud: tau ama.
Oblique spar at peak of modern gaff sail: toko.
Paddle: 'oe.
Bailer: tata.

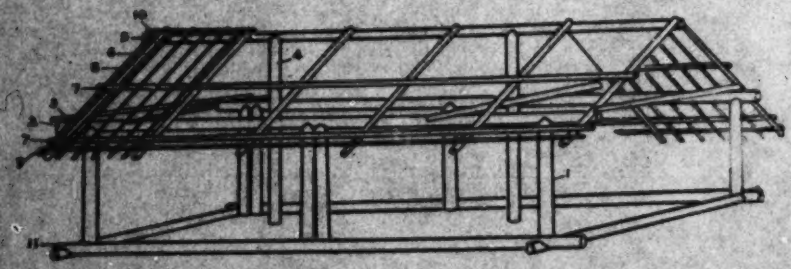
2:Macgregor E-2 (1933) 1935 Pukapukans

HOUSES

The village of Pukapuka presents an array of varied house types which have been adopted from European and Cook Islands forms. Dwellings on piles, and others with piazzas, doors, and windows, are all common. European frame buildings and houses with coral walls and roofs of thatch or corrugated iron have displaced many of the simpler native ones. No perfect native house of ancient type exists



a



b

FIGURE 12.—House construction: *a*, framework of end: 1, supporting post; 2, tie-beam plate; 3, tie beam; 4, main ridgepole; 5, rafter; 6, middle end rafter; 7, lateral end rafter; 8, end thatch rafter; 9, end purlin; 10, end eave batten. *b*, framework of house: 1, supporting post which holds up tie beam (2); 3, tie beams resting across ends of tie-beam plate; 4, center post, supporting main ridgepole (5); 6, rafter, supported on tie-beam plate and main ridgepole; 7, purlin, supported by rafters; 8, thatch rafter supported by purlins; 9, eave batten across ends of thatch rafters; 10, upper ridgepole resting in crotch formed by rafters and supporting ends of thatch rafters; 11, logs about boundaries of house floor for retaining coral pebble flooring. Sketched by Toshio Asaeda.

2:Macgregor E-2 (1933) 1935 Pukapukans

except the old watch house (pl. 3) in the taro patches behind the village. This house is estimated to be at least 75 years old, for it was built more than three generations ago. The wood is of great age and two posts have had to be replaced by new ones. The house is patterned like the common rectangular house of the Cook Islands but is roughly built and has eaves higher above the ground than was usual in the houses of the pre-European period (fig. 12).

The six supporting posts and two center posts are greater in size than those used in any of the modern houses. The six supporting posts are erected in the four corners and in the middle of the two sides (fig. 12, *b*). The tops have the natural fork of the trunk and branch, or a broad groove is cut for the tie-beam plates to rest in. The two center posts are erected along the middle line through the house and have grooves similar to those in the supporting posts, for holding the main ridgepole. Four tie beams lie across the tie-beam plates at the ends and middle of the house, the middle tie beams being on the outer side of the center posts. The principal rafters rest on the tie-beam plates and cross above the main ridgepole. The upper ridgepole lies in the forks formed by the rafter ends. Two purlins are set across the rafters on each side, one across the middle and one across the lower ends. The thatch rafters are laid at close intervals over the purlins. The eave batten, which supports the lowest tier of thatch, is secured across the lower ends of the thatch rafter.

The gable end of the house is made with an outward pitch by running the end pair of principal side rafters obliquely to the ridgepole, crossing it about 2 feet from the end, thus making the three principal end rafters resting on them slant out to the end tie beam (fig. 12, *a*). There are three principal end rafters, one in the center lashed against the ridgepole, and one on each side at points half-way to the tie beam plates at the side. A purlin is placed across the lower ends of the principal end rafters. The end thatch rafters lie outside the last pair of side thatch rafters and the end purlin. The end eave batten is across the lower end of the thatch rafters.

The thatch is made of sheets of coconut leaves. A leaf is split through the midrib, the thickness whittled down, and the leaflets of each half plaited in simple check. The thatching is commenced at the eaves of the roof and built up to the ridgepole. Each new sheet is placed with the midrib uppermost and is lashed just above the one below. The thatching is closed by a ridgepole sheet plaited from halves of split coconut leaves plaited first separately, the tips then plaited together leaving the midribs hanging on either side when the sheet is put on the roof.

Many houses of the village have roofs of lauhala thatch. To prepare the leaves for thatching they are soaked in the sea, dried on the beach in the sun, and then flattened by pulling them firmly around a stake set in the ground. The roof sheet is made by bending the butt of each leaf over a rod and pinning it upon itself with coconut-leaflet midrib. The leaf is punctured with a needle of bone or wood,

2:Macgregor E-2 (1933) 1935 Pukapukans

and the midrib is pushed through the hole before the needle is withdrawn. As shown by Buck (12) the same technique is used in the Cook Islands. 000

Most dwelling houses are built on a double platform of coral rubble, the lower platform several feet larger than the floor of the house. The upper platform, which forms the floor of the house, is made on the first platform and extends about 1 foot outside the walls of the house. Each platform is retained by logs or a curbing of coral slabs 8 or 10 inches high.

ADZES

For cutting out canoes and shaping timbers, the Pukapukans, like the dwellers on other Polynesian atolls, made adzes from the *Tridacna* shell—the only local material available. 321 412

In the adz shown in figure 13, *a*, the poll is pointed and the side curves to the rounded cutting edges. The striated outer surface of the shell has been left on the convex front and only the bevel ground smooth. The concave inner surface forms the back which has the grinding surface to sharpen the cutting edge.

Another shell adz (fig. 13, *b*) is roughly rectangular in shape. The front is the outer stratified surface of the shell, except at the bevel which is ground on this surface; the back is the concave inner nacreous surface of the shell; the cutting edge is slightly convex. Part of the concavity and thickness of the shell have been removed by grinding down the outer rim until only a slight depression is left in the center. Along the slightly concave cutting edge and the two sides the surface is smooth and flat. The poll is broad and irregular and has a rough broken surface.

An adz found in Pukapuka (but obviously an importation) is made of basalt and is of the type common to western Polynesia (fig. 14). It is a long, thin, flat, quadrangular, tangless adz that tapers from the cutting edge to the poll. The front surface is slightly convex and is narrower than the back. The front, also the bevel of the back, are ground smooth. The remainder of the back and the two sides have rough chipped surfaces. The edge of the blade is straight; the bevel is convex longitudinally. Due to the rough, unground surface of the back, the chin is irregular. 177 412

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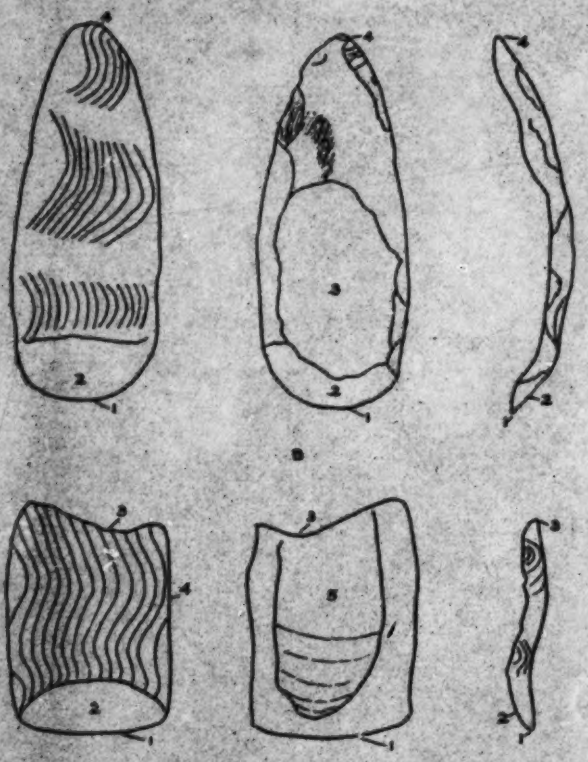

FIGURE 13.—Adzes of *Tridacna* shell. *a*, back, front, and side views (adz no. C 6527, Bernice P. Bishop Museum): 1, cutting edge; 2, bevel; 3, concavity of surface; 4, poll; greatest length, 4.75 inches. *b*, back, front and side views (adz in possession of R. D. Frisbie, Tahiti): 1, cutting edge; 2, ground bevel; 3, poll; 4, straight side; 5, central depression from natural concavity of shell; greatest length, 3 inches.

UTENSILS

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A small satchel of lauhala collected at Pukapuka has the following features.

Rectangular-sided and measuring 10 inches long, 8 inches high, and 1.5 inches wide, the satchel is made in simple check pattern. The bottom is flat and has square corners made by turning the strips as they are plaited. Each side is ornamented with strips of hala dyed red with native dyes. These strips are inserted over and included with the plaited elements. The pattern is X-shaped and is 7 inches long. On one side of the basket a solid square of the dyed hala is made between the forks formed by each arm of the X. The reverse side has two squares in each fork. The plaiting is commenced and

2:Macgregor E-2 (1933) 1935 Pukapukans

finished at the edge of the basket and is seamless. The end elements of the finishing edge are turned over and worked into the plaiting over the opposite elements. The basket has two handles made of braided strips of hala which are sewed to the sides.

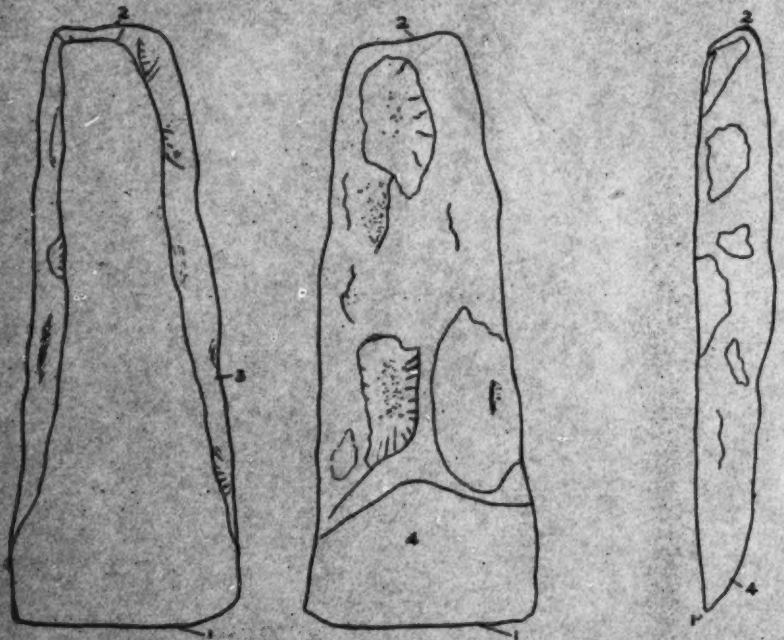

FIGURE 14.—Quadrilateral adz of basalt (no. B 8809, Bernice P. Bishop Museum), front, back, and side views: 1, cutting edge; 2, poll; 3, oblique side; 4, bevel; greatest length 7.5 inches.

Food is mixed in wooden bowls (*kumete*) (fig. 15). They are hewn from single pieces of wood and shaped into elliptical bowls with flat bottoms. Short handles are cut at either end.

FIGURE 15.—Elliptical wooden food bowl with end lug handles and flat bottom.

2;Macgregor E-2 (1933) 1935 Pukapukans

AMUSEMENTS

Wrestling has always been a sport of great interest in Pukapuka. It is said that in former times the best wrestlers of the island traveled to other islands to challenge foreign champions. Competitions are still held between the men of the three sections of the village. An exhibition of the ancient sport was given by several young men one afternoon of our stay:

The match was held on the village green (*kolo*). Shelters for spectators stood on either side. A ring (*oni*) was marked off by thin stakes about 3 feet high, which were connected by a light rope. This ring was erected before the shelters of the village section that had been victorious in the last intra-village match. Before the match took place, the people of the victorious section marched in single file through the village, shouting the names of their wrestlers and boasting of their prowess. They challenged any one in the village to come out and wrestle with them. The procession ended at the winner's shelter, and the first two wrestlers of their side stepped out. They trotted about the ring, stopping at intervals and resting their left hands on the line and kicking to the side with their right legs. Two men came across the green from the opponents' side, and the first pair to engage stepped inside the circle.

As the two wrestlers approached they stooped forward, slapped their thighs, and raised their hands and clasped them to the side three times before engaging. The object was to lift the opponent from the ground or to throw him off his balance and put one hand on the ground. When one man was thrown, another of his side took his place against the victor.

The exhibition matches ended very quickly and showed little skill. It was said that the old contests between trained men lasted for many hours. In olden days each family possessed a wrestler's malo which was preserved for the sport. This was the great heirloom which every father passed down to his son. If a man had no son of his own, he adopted one to inherit his family malo. Many of these malos have been preserved to the present time and were brought out for exhibition (pl. 4):

The band is a long narrow strip of *kie* (*Pandanus*) plaited in geometric patterns. It is made 8 to 12 inches wide and doubled. In putting on the malo a heavy five-ply braid of sennit (*kaura*) is first wound around the waist a dozen or more times and the malo is secured around this. The end of the band is placed in front of the sennit belt, passed over and under, carried between the legs and under the belt behind, wound two times around the girdle on the right side to the front again, passed between the legs, wound two times around the left side, and secured. Each end of the band is folded to a point and tied with a light piece of coir cord which is lashed to the sennit girdle to hold the band in place. When not in use, the sennit belt and the band are rolled in flat discs for storage in the house.

2:Macgregor E-2 (1933) 1935 Pukapukans

The dances seen during an evening's entertainment were performed by a small number of people in Loto village: 535 177

Men and women danced together in four lines, the men performing one set of movements in unison, the women performing another set. In one dance the men brought their knees up high in a stationary run or kicked their heels behind them, while the women moved their hips rapidly from side to side, keeping the upper part of their bodies motionless. The gestures and steps of this dance and several others recorded in motion pictures are identical with rapidly performed dances of Tahiti. Each dance was led by one man, who made gestures and remarks amusing to the natives.

The accompaniment was kept with an improvised drum made of a roll of mats. The rhythm was first given, and after a long roll of the drumsticks the dance commenced. Throughout the dances, the dancers sang songs which they called *'imine*, a Tahitian word derived from the English "hymn."

LITERATURE CITED 113

1. Bryan, E. H., Jr., Manuscript, B. P. Bishop Museum.
2. Emory, K. P., Tuamotuan stone structures: B. P. Bishop Mus., Bull. 118, 1934.
3. Friend, R. D., The book of Puka-Puka, New York, 1928.
4. Gill, W. W., Life in the southern isles, London, 1876.
5. Gill, W. W., A word about the original inhabitants of Pukapuka Island: Polynesian Soc., Jour., vol. 21, pp. 122-124, 1912.
6. Hornchin, J. J. K., Traditions and some words of the language of Danger or Pukapuka Island: Polynesian Soc., Jour., vol. 13, pp. 173-176, 1904.
7. Kennedy, D. G., Field notes on the culture of Vaitupu, Ellice Islands: Polynesian Soc., Mem., vol. 9, 1931.
8. Lovett, Richard, History of the London Missionary Society, vol. 1, London, 1899.
9. Maccregor, Gordon, Manuscript, Bernice P. Bishop Museum.
10. Pratt, George, Grammar and dictionary of the Samoan language, 4th ed., Samoa, 1911.
11. Stewart's Handbook of the Pacific Islands [Percy Allen, editor], Sydney, New South Wales, 1923.
12. Te Rangi Hiroa (P. H. Buck), Ethnology of Tongareva: B. P. Bishop Mus., Bull. 92, 1932.
13. Te Rangi Hiroa (P. H. Buck), Ethnology of Manihiki and Rakahanga: B. P. Bishop Mus., Bull. 99, 1932.
14. Te Rangi Hiroa (P. H. Buck), Mangaian Society: B. P. Bishop Mus., Bull. 122, 1934.
15. Te Rangi Hiroa (P. H. Buck), Samoan material culture: B. P. Bishop Mus., Bull. 75, 1930.
16. Tregear, Edward, The Maori-Polynesian comparative dictionary, Wellington, New Zealand, 1891.
17. Trotter, R. S., Glossary [Rarotongan-English and English-Rarotongan], Rarotonga. [No date.]

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PLATE 1.—Burial marae of high chiefs showing triangular, rectangular, and "tarod" types of grave stones.

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A

B

PLATE 2.—Taro patches: *A*, individual taro patch in an excavation sunk below the general surface of the island; *B*, taro pit in communal garden of Te Motu; embankment formed partly by excavation and partly by heaping the excavated soil into a ridge.

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PLATE 3.—House in Te Motu, used by watchmen in ancient times to guard over taro patches. One original corner post and one side post have been reenforced by new posts.

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PLATE 4.—Wrestler's malo.